

- E. ROOF-PENETRATION FLASHING: COORDINATE INSTALLATION OF ROOF-PENETRATION FLASHING WITH INSTALLATION OF ROOFING AND OTHER ITEMS PENETRATING ROOF. INSTALL FLASHING AS FOLLOWS:
1. TURN LEAD FLASHING DOWN INSIDE VENT PIPING, BEING CAREFUL NOT TO BLOCK VENT PIPING WITH FLASHING.
2. SEAL WITH ELASTOMERIC SEALANT AND CLAMP FLASHING TO PIPES PENETRATING ROOF EXCEPT FOR LEAD FLASHING ON VENT PIPING.

SECTION 077200 - ROOF ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

- A. THIS SECTION INCLUDES THE FOLLOWING:

1. ROOF HATCHES.

1.2 SUBMITTALS

- A. PRODUCT DATA: FOR EACH TYPE OF ROOF ACCESSORY INDICATED.
- B. SHOP DRAWINGS: SHOW FABRICATION AND INSTALLATION DETAILS FOR ROOF ACCESSORIES.
- C. SAMPLES: FOR EACH TYPE OF EXPOSED FACTORY-APPLIED COLOR FINISH REQUIRED AND FOR EACH TYPE OF ROOF ACCESSORY INDICATED, PREPARED ON SAMPLES OF SIZE TO ADEQUATELY SHOW COLOR.

1.3 QUALITY ASSURANCE

- A. SHEET METAL STANDARD: COMPLY WITH SMACNA'S "ARCHITECTURAL SHEET METAL MANUAL" DETAILS FOR FABRICATION OF UNITS, INCLUDING FLANGES AND CAP FLASHING TO COORDINATE WITH TYPE OF ROOFING INDICATED.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. AVAILABLE MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO, MANUFACTURERS LISTED IN OTHER PART 2 ARTICLES.

2.2 METAL MATERIALS

- A. GALVANIZED STEEL SHEET: ASTM A 653/A 653M, G90 (Z275) COATED AND MILL PHOSPHATIZED FOR FIELD PAINTING.

2.3 ROOF HATCHES

- A. ROOF HATCHES: FABRICATE ROOF HATCHES WITH INSULATED DOUBLE-WALL LIDS AND INSULATED DOUBLE-WALL CURB FRAME WITH INTEGRAL DECK MOUNTING FLANGE AND LID FRAME COUNTERFLASHING. FABRICATE WITH WELDED OR MECHANICALLY FASTENED AND SEALED CORNER JOINTS. PROVIDE CONTINUOUS WEATHERTIGHT PERIMETER GASKETING AND EQUIP WITH CORROSION-RESISTANT OR HOT-DIP GALVANIZED HARDWARE.
1. MANUFACTURERS:
- a. BILCO COMPANY (THE).
2. CURB AND LID MATERIAL: STAINLESS-STEEL SHEET, 0.078 INCH (1.98 MM) THICK.
- a. FINISH: MILL.
3. INSULATION: GLASS-FIBER OR POLYISOCYANURATE BOARD.
4. INTERIOR LID LINER: MANUFACTURER'S STANDARD METAL LINER OF SAME MATERIAL AND FINISH AS OUTER METAL LID.
5. EXTERIOR CURB LINER: MANUFACTURER'S STANDARD METAL LINER OF SAME MATERIAL AND FINISH AS METAL CURB.
6. FABRICATE UNITS TO MINIMUM HEIGHT OF 12 INCHES (300 MM), UNLESS OTHERWISE INDICATED.
7. SLOPING ROOFS: WHERE SLOPE OR ROOF DECK EXCEEDS 1:48, FABRICATE HATCH CURBS WITH HEIGHT CONSTANT.
8. HARDWARE: GALVANIZED STEEL OR STAINLESS-STEEL SPRING LATCH WITH TURN HANDLES, BUTT- OR PINTLE-TYPE HINGE SYSTEM, AND PADLOCK HASPS INSIDE AND OUTSIDE.
9. LADDER SAFETY POST: MANUFACTURER'S STANDARD LADDER SAFETY POST. POST TO LOCK IN PLACE ON FULL EXTENSION. PROVIDE RELEASE MECHANISM TO RETURN POST TO CLOSED POSITION.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. GENERAL: INSTALL ROOF ACCESSORIES ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS. ANCHOR ROOF ACCESSORIES SECURELY IN PLACE AND CAPABLE OF RESISTING FORCES SPECIFIED. USE FASTENERS, SEPARATORS, SEALANTS, AND OTHER MISCELLANEOUS ITEMS AS REQUIRED FOR COMPLETING ROOF ACCESSORY INSTALLATION. INSTALL ROOF ACCESSORIES TO RESIST EXPOSURE TO WEATHER WITHOUT FAILING, RATTLING, LEAKING, AND FASTENER ENGAGEMENT.
- B. INSTALL ROOF ACCESSORIES TO FIT SUBSTRATES AND TO RESULT IN WATERTIGHT PERFORMANCE.
- C. METAL PROTECTION: WHERE DISSIMILAR METALS WILL CONTACT EACH OTHER OR CORROSIVE SUBSTRATES, PROTECT AGAINST GALVANIC ACTION BY PAINTING CONTACT SURFACES WITH BITUMINOUS COATING OR BY OTHER PERMANENT SEPARATION AS RECOMMENDED BY MANUFACTURER.
1. COAT CONCEALED SIDE OF UNCOATED ALUMINUM OR STAINLESS-STEEL ROOF ACCESSORIES WITH BITUMINOUS COATING WHERE IN CONTACT WITH WOOD, FERROUS METAL, OR CEMENTITIOUS CONSTRUCTION.
2. UNDERLAYMENT: WHERE INSTALLING EXPOSED-TO-VIEW COMPONENTS OF ROOF ACCESSORIES DIRECTLY ON CEMENTITIOUS OR WOOD SUBSTRATES, INSTALL A COURSE OF FELT UNDERLAYMENT AND COVER WITH A SLIP SHEET, OR INSTALL A COURSE OF POLYETHYLENE UNDERLAYMENT.
3. BED FLANGES IN THICK COAT OF ASPHALT ROOFING CEMENT WHERE REQUIRED BY ROOF ACCESSORY MANUFACTURERS FOR WATERPROOF PERFORMANCE.
- D. INSTALL ROOF ACCESSORIES LEVEL, PLUMB, TRUE TO LINE AND ELEVATION, AND WITHOUT WARPING, JOGS IN ALIGNMENT, EXCESSIVE OIL CANNING, BUCKLING, OR TOOL MARKS.
- E. SEAL JOINTS WITH ELASTOMERIC OR BUTYL SEALANT AS REQUIRED BY MANUFACTURER OF ROOF ACCESSORIES.

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

- A. THIS SECTION INCLUDES JOINT SEALANTS FOR THE FOLLOWING APPLICATIONS, INCLUDING THOSE SPECIFIED BY REFERENCE TO THIS SECTION:
1. EXTERIOR JOINTS IN VERTICAL SURFACES AND HORIZONTAL NONTRAFFIC SURFACES.
2. EXTERIOR JOINTS IN HORIZONTAL TRAFFIC SURFACES.
3. INTERIOR JOINTS IN VERTICAL SURFACES AND HORIZONTAL NONTRAFFIC SURFACES.
4. INTERIOR JOINTS IN HORIZONTAL TRAFFIC SURFACES.
- B. SEE DIVISION 32 SECTION "CONCRETE PAVING JOINT SEALANTS" FOR SEALING JOINTS IN PAVEMENTS, WALKWAYS, AND CURBING.
- C. SEE DIVISION 08 SECTION "GLAZING" FOR GLAZING SEALANTS.

1.2 PERFORMANCE REQUIREMENTS

- A. PROVIDE ELASTOMERIC JOINT SEALANTS THAT ESTABLISH AND MAINTAIN WATERTIGHT AND AIRTIGHT CONTINUOUS JOINT SEALS WITHOUT STAINING OR DETERIORATING JOINT SUBSTRATES.

- B. PROVIDE JOINT SEALANTS FOR INTERIOR APPLICATIONS THAT ESTABLISH AND MAINTAIN AIRTIGHT AND WATER-RESISTANT CONTINUOUS JOINT SEALS WITHOUT STAINING OR DETERIORATING JOINT SUBSTRATES.
- 1.3 SUBMITTALS
- A. PRODUCT DATA: FOR EACH JOINT-SEALANT PRODUCT INDICATED.
- B. SAMPLES: FOR EACH TYPE AND COLOR OF JOINT SEALANT REQUIRED, PROVIDE SAMPLES WITH JOINT SEALANTS IN 1/2-INCH- (13-MM-) WIDE JOINTS FORMED BETWEEN TWO 6-INCH- (150-MM-) LONG STRIPS OF MATERIAL MATCHING THE APPEARANCE OF EXPOSED SURFACES ADJACENT TO JOINT SEALANTS.

1.4 QUALITY ASSURANCE

- A. PRECONSTRUCTION FIELD-ADHESION TESTING: BEFORE INSTALLING ELASTOMERIC SEALANTS, FIELD TEST THEIR ADHESION TO PROJECT JOINT SUBSTRATES ACCORDING TO THE METHOD IN ASTM C 1193 THAT IS APPROPRIATE FOR THE TYPES OF PROJECT JOINTS.

1.5 WARRANTY

- A. SPECIAL INSTALLER'S WARRANTY: INSTALLER'S STANDARD FORM IN WHICH INSTALLER AGREES TO REPAIR OR REPLACE ELASTOMERIC JOINT SEALANTS THAT DO NOT COMPLY WITH PERFORMANCE AND OTHER REQUIREMENTS SPECIFIED IN THIS SECTION WITHIN SPECIFIED WARRANTY PERIOD.
1. WARRANTY PERIOD: TWO YEARS FROM DATE OF SUBSTANTIAL COMPLETION.
- B. SPECIAL MANUFACTURER'S WARRANTY: MANUFACTURER'S STANDARD FORM IN WHICH ELASTOMERIC SEALANT MANUFACTURER AGREES TO FURNISH ELASTOMERIC JOINT SEALANTS TO REPAIR OR REPLACE THOSE THAT DO NOT COMPLY WITH PERFORMANCE AND OTHER REQUIREMENTS SPECIFIED IN THIS SECTION WITHIN SPECIFIED WARRANTY PERIOD.
1. WARRANTY PERIOD: 20 YEARS FROM DATE OF SUBSTANTIAL COMPLETION.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. IN OTHER PART 2 ARTICLES WHERE SUBPARAGRAPH TITLES BELOW INTRODUCE LISTS, THE FOLLOWING REQUIREMENTS APPLY FOR PRODUCT SELECTION:
- B. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PRODUCTS BY ONE OF THE MANUFACTURERS SPECIFIED.
1. PRODUCTS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE THE PRODUCT OR AN EQUIVALENT PRODUCT BY ONE OF THE MANUFACTURERS SPECIFIED FOR THAT TYPE OF SEALANT.
- C. MANUFACTURERS - GENERAL
1. SILICONE SEALANT: TREMCO.
2. POLYURETHANE SEALANT: TREMCO.
3. BUTYL RUBBER SEALANT: TREMCO.
4. AND AS SPECIFIED HEREIN.
- 2.2 MATERIALS, GENERAL

- A. COMPATIBILITY: PROVIDE JOINT SEALANTS, BACKINGS, AND OTHER RELATED MATERIALS THAT ARE COMPATIBLE WITH ONE ANOTHER AND WITH JOINT SUBSTRATES UNDER CONDITIONS OF SERVICE AND APPLICATION, AS DEMONSTRATED BY SEALANT MANUFACTURER, BASED ON TESTING AND FIELD EXPERIENCE.
- B. COLORS OF EXPOSED JOINT SEALANTS: AS INDICATED ON DRAWINGS. IF NOT INDICATED, AS SELECTED BY OWNER'S REPRESENTATIVE FROM MANUFACTURERS FULL RANGE OF COLORS.

2.3 ELASTOMERIC JOINT SEALANTS

- A. ELASTOMERIC SEALANTS, GENERAL: ASTM C 920.
1. CONTINUOUS-IMMERSION SEALANTS: FOR IMMERSION IN WATER, PRODUCTS TESTED ACCORDING TO ASTM C 1247, INCLUDING INITIAL SIX-WEEK IMMERSION PERIOD AND TWO ADDITIONAL IMMERSION FOUR WEEK IMMERSION PERIOD(S), WITHOUT FAILING IN ADHESION OR COHESION WHEN TESTED WITH SUBSTRATES INDICATED.
2. SEALANTS FOR CONTACT WITH FOOD: COMPLY WITH 21 CFR 177.2600.
- B. LOW-MODULUS NONACID-CURING SILICONE SEALANT: DOW CORNING CORP., 790 SILICONE BUILDING SEALANT.
1. TYPE AND GRADE: S (SINGLE COMPONENT) AND NS (NONSAG).
2. CLASS: 25.
3. ADDITIONAL MOVEMENT CAPABILITY: CAPABLE OF 100 PERCENT MOVEMENT IN EXTENSION AND 50 PERCENT MOVEMENT IN COMPRESSION WHEN TESTED FOR ADHESION AND COHESION UNDER MAXIMUM CYCLIC MOVEMENT PER ASTM C 719.
4. EXPOSURE: USE NT (NONTRAFFIC).
5. SUBSTRATES: USES M, G, A, AND, AS APPLICABLE TO JOINT SUBSTRATES INDICATED, O.
6. NONSTAINING TO POROUS SUBSTRATES WHEN TESTING PER ASTM C 1248 FOR SUBSTRATES INDICATED.
- C. MEDIUM-MODULUS NEUTRAL-CURING SILICONE SEALANT: DOW CORNING CORP., 795 SILICONE BUILDING SEALANT.
1. TYPE AND GRADE: S (SINGLE COMPONENT) AND NS (NONSAG).
2. CLASS: 25.
3. EXPOSURE: USE NT (NONTRAFFIC).
4. SUBSTRATES: USES M, G & A.
5. NONSTAINING TO POROUS SUBSTRATES WHEN TESTING PER ASTM C 1248 FOR SUBSTRATES INDICATED.
- D. MILDEW-RESISTANT SILICONE SEALANT: DOW CORNING CORP., 786 MILDEW-RESISTANT SILICONE SEALANT.
1. TYPE AND GRADE: S (SINGLE COMPONENT) AND NS (NONSAG).
2. CLASS: 25.
3. EXPOSURE: USE NT (NONTRAFFIC).
4. SUBSTRATES: USES G, A AND, AS APPLICABLE TO JOINT SUBSTRATES INDICATED, O.
- E. POURABLE SILICONE SEALANT: DOW CORNING CORP., 890-SL SELF-LEVELING SILICONE JOINT SEALANT.

1. TYPE AND GRADE: S (SINGLE COMPONENT) AND P (POURABLE)
2. CLASS: 25.
3. ADDITIONAL MOVEMENT CAPABILITY: 100 PERCENT MOVEMENT IN EXTENSION AND 50 PERCENT IN COMPRESSION WHEN TESTED FOR ADHESION AND COHESION UNDER MAXIMUM CYCLIC MOVEMENT PER ASTM C 719.
4. EXPOSURE: USE T (TRAFFIC).
5. SUBSTRATES: M AND, AS APPLICABLE TO JOINT SUBSTRATES INDICATED, O.
- F. MULTICOMPONENT NONSAG URETHANE SEALANT: SONNEBORN BUILDING PRODUCTS DIVISION, CHEMREX, INC., SONOLASTIC SL 2.
1. TYPE AND GRADE: M (MULTICOMPONENT) AND NS (NONSAG).
2. CLASS: 25.
3. ADDITIONAL MOVEMENT CAPABILITY: 50 PERCENT MOVEMENT IN EXTENSION AND 50 PERCENT IN COMPRESSION WHEN TESTED FOR ADHESION AND COHESION UNDER MAXIMUM CYCLIC MOVEMENT PER ASTM C 719.
4. EXPOSURE: USE NT (NONTRAFFIC) AND T (TRAFFIC).
5. SUBSTRATES: M, G, A, AND, AS APPLICABLE TO JOINT SUBSTRATES INDICATED, O.

- G. MULTICOMPONENT POURABLE URETHANE SEALANT: SONNEBORN BUILDING PRODUCTS DIVISION, CHEMREX, INC., SONOLASTIC SL 2.
1. TYPE AND GRADE: M (MULTICOMPONENT) AND P (POURABLE).
2. CLASS: 25.
3. EXPOSURE: T (TRAFFIC).
4. SUBSTRATE: USE M.

- H. SINGLE-COMPONENT NONSAG URETHANE SEALANT: SONNEBORN BUILDING PRODUCTS DIVISION, CHEMREX, INC., SONOLASTIC NP 1.
1. TYPE AND GRADE: S (SINGLE COMPONENT) AND NS (NONSAG).
2. CLASS: 25.
3. EXPOSURE: NT (NONTRAFFIC).
4. SUBSTRATES: M, G, A, AND, AS APPLICABLE TO JOINT SUBSTRATES INDICATED, O.

- I. SINGLE-COMPONENT POURABLE URETHANE SEALANT: SONNEBORN BUILDING PRODUCTS DIVISION, CHEMREX, INC., SONOLASTIC SL 1.
1. TYPE AND GRADE: S (SINGLE COMPONENT) AND P (POURABLE).
2. CLASS: 25.
3. EXPOSURE: T (TRAFFIC)
4. SUBSTRATE: M.

2.4 SOLVENT-RELEASE JOINT SEALANTS

- A. BUTYL-RUBBER-BASED SOLVENT-RELEASE JOINT SEALANT: ASTM C 1085, PECORA CORPORATION; BC-158 BUTYL RUBBER SEALANT.
1. TYPE AND GRADE: S (SINGLE COMPONENT) AND NS (NONSAG).
2. CLASS: 25.
3. EXPOSURE: NT (NONTRAFFIC).

2.5 JOINT-SEALANT BACKING

- A. GENERAL: PROVIDE SEALANT BACKINGS OF MATERIAL AND TYPE THAT ARE NONSTAINING; ARE COMPATIBLE WITH JOINT SUBSTRATES, SEALANTS, PRIMERS, AND OTHER JOINT FILLERS; AND ARE APPROVED FOR APPLICATIONS INDICATED BY SEALANT MANUFACTURER BASED ON FIELD EXPERIENCE AND LABORATORY TESTING.
- B. CYLINDRICAL SEALANT BACKINGS: ASTM C 1930, OF SIZE AND DENSITY TO CONTROL SEALANT DEPTH AND OTHERWISE CONTRIBUTE TO PRODUCING OPTIMUM SEALANT PERFORMANCE:
1. TYPE: C (CLOSED-CELL MATERIAL WITH A SURFACE SKIN).
- C. ELASTOMERIC TUBING SEALANT BACKINGS: NEOPRENE, BUTYL, EPDM, OR SILICONE TUBING COMPLYING WITH ASTM D 1056, NONABSORBENT TO WATER AND GAS, AND CAPABLE OF REMAINING RESILIENT AT TEMPERATURES DOWN TO MINUS 26 DEG F. PROVIDE PRODUCTS WITH LOW COMPRESSION SET AND OF SIZE AND SHAPE TO PROVIDE A SECONDARY SEAL, TO CONTROL SEALANT DEPTH, AND TO OTHERWISE CONTRIBUTE TO OPTIMUM SEALANT PERFORMANCE.
- D. BOND-BREAKER TAPE: POLYETHYLENE TAPE OR OTHER PLASTIC TAPE RECOMMENDED BY SEALANT MANUFACTURER FOR PREVENTING SEALANT FROM ADHERING TO RIGID, INFLEXIBLE JOINT-FILLER MATERIALS OR JOINT SURFACES AT BACK OF JOINT WHERE SUCH ADHESION WOULD RESULT IN SEALANT FAILURE. PROVIDE SELF-ADHESIVE TAPE WHERE APPLICABLE.

2.6 MISCELLANEOUS MATERIALS

- A. PRIMER: MATERIAL RECOMMENDED BY JOINT-SEALANT MANUFACTURER WHERE REQUIRED FOR ADHESION OF SEALANT TO JOINT SUBSTRATES INDICATED, AS DETERMINED FROM PRECONSTRUCTION JOINT-SEALANT-SUBSTRATE TESTS AND FIELD TESTS.
- B. CLEANERS FOR NONPOROUS SURFACES: CHEMICAL CLEANERS ACCEPTABLE TO MANUFACTURERS OF SEALANTS AND SEALANT BACKING MATERIALS, FREE OF OILY RESIDUES OR OTHER SUBSTANCES CAPABLE OF STAINING OR HARMING JOINT SUBSTRATES AND ADJACENT NONPOROUS SURFACES IN ANY WAY, AND FORMULATED TO PROMOTE OPTIMUM ADHESION OF SEALANTS TO JOINT SUBSTRATES.
- C. MASKING TAPE: NONSTAINING, NONABSORBENT MATERIAL COMPATIBLE WITH JOINT SEALANTS AND SURFACES ADJACENT TO JOINTS.

PART 3 - EXECUTION

3.1 PREPARATION

- A. SURFACE CLEANING OF JOINTS: CLEAN OUT JOINTS IMMEDIATELY BEFORE INSTALLING JOINT SEALANTS.
1. REMOVE ALL FOREIGN MATERIAL FROM JOINT SUBSTRATES THAT COULD INTERFERE WITH ADHESION OF JOINT SEALANT.
2. CLEAN POROUS JOINT SUBSTRATE SURFACES BY BRUSHING, GRINDING, BLAST CLEANING, MECHANICAL ABRADING, OR A COMBINATION OF THESE METHODS TO PRODUCE A CLEAN, SOUND SUBSTRATE CAPABLE OF DEVELOPING OPTIMUM BOND WITH JOINT SEALANTS. REMOVE LOOSE PARTICLES REMAINING AFTER CLEANING OPERATIONS ABOVE BY VACUUMING OR BLOWING OUT JOINTS WITH OIL-FREE COMPRESSED AIR.
3. REMOVE LAITANCE AND FORM-RELEASE AGENTS FROM CONCRETE.
4. CLEAN NONPOROUS SURFACES WITH CHEMICAL CLEANERS OR OTHER MEANS THAT DO NOT STAIN, HARM SUBSTRATES, OR LEAVE RESIDUES CAPABLE OF INTERFERING WITH ADHESION OF SEALANTS TO JOINT SUBSTRATES.
- B. JOINT PRIMING: PRIME JOINT SUBSTRATES, WHERE RECOMMENDED IN WRITING BY JOINT-SEALANT MANUFACTURER, BASED ON PRECONSTRUCTION JOINT-SEALANT-SUBSTRATE TESTS OR PRIOR EXPERIENCE. APPLY PRIMER TO COMPLY WITH JOINT-SEALANT MANUFACTURER'S WRITTEN INSTRUCTIONS. CONFINE PRIMERS TO AREAS OF JOINT-SEALANT BOND; DO NOT ALLOW SPILLAGE OR MIGRATION ONTO ADJOINING SURFACES.
- C. MASKING TAPE: USE MASKING TAPE WHERE REQUIRED TO PREVENT CONTACT OF SEALANT WITH ADJOINING SURFACES THAT OTHERWISE WOULD BE PERMANENTLY STAINED OR DAMAGED BY SUCH CONTACT OR BY CLEANING METHODS REQUIRED TO REMOVE SEALANT SMEARS. REMOVE TAPE IMMEDIATELY AFTER TOOLING WITHOUT DISTURBING JOINT SEAL.
- D. SEALANT INSTALLATION: COMPLY WITH RECOMMENDATIONS IN ASTM C 1193 FOR USE OF JOINT SEALANTS AS APPLICABLE TO MATERIALS, APPLICATIONS, AND CONDITIONS INDICATED.
- E. ACOUSTICAL SEALANT APPLICATION STANDARD: COMPLY WITH RECOMMENDATIONS IN ASTM C 919 FOR USE OF JOINT SEALANTS IN ACOUSTICAL APPLICATIONS AS APPLICABLE TO MATERIALS, APPLICATIONS, AND CONDITIONS INDICATED.
- F. INSTALL SEALANT BACKINGS OF TYPE INDICATED TO SUPPORT SEALANTS DURING APPLICATION AND AT POSITION REQUIRED TO PRODUCE CROSS-SECTIONAL SHAPES AND DEPTHS OF INSTALLED SEALANTS RELATIVE TO JOINT WIDTHS THAT ALLOW OPTIMUM SEALANT MOVEMENT CAPABILITY.
1. DO NOT LEAVE GAPS BETWEEN ENDS OF SEALANT BACKINGS.
2. DO NOT STRETCH, TWIST, PUNCTURE, OR TEAR SEALANT BACKINGS.
3. REMOVE ABSORBENT SEALANT BACKINGS THAT HAVE BECOME WET BEFORE SEALANT APPLICATION AND REPLACE THEM WITH DRY MATERIALS.
- G. INSTALL BOND-BREAKER TAPE BEHIND SEALANTS WHERE SEALANT BACKINGS ARE NOT USED BETWEEN SEALANTS AND BACKS OF JOINTS.
1. PLACE SEALANTS SO THEY DIRECTLY CONTACT AND FULLY WET JOINT SUBSTRATES.
2. COMPLETELY FILL RECESSES IN EACH JOINT CONFIGURATION.
3. PRODUCE UNIFORM, CROSS-SECTIONAL SHAPES AND DEPTHS RELATIVE TO JOINT WIDTHS THAT ALLOW OPTIMUM SEALANT MOVEMENT CAPABILITY.
- H. TOOLING OF NONSAG SEALANTS: IMMEDIATELY AFTER SEALANT APPLICATION AND BEFORE SKINNING OR CURING BEGINS, TOOL SEALANTS ACCORDING TO REQUIREMENTS SPECIFIED BELOW TO FORM SMOOTH, UNIFORM BEADS OF CONFIGURATION INDICATED; TO ELIMINATE AIR POCKETS; AND TO ENSURE CONTACT AND ADHESION OF SEALANT WITH SIDES OF JOINT.
1. REMOVE EXCESS SEALANT FROM SURFACES ADJACENT TO JOINTS.
2. USE TOOLING AGENTS THAT ARE APPROVED IN WRITING BY SEALANT MANUFACTURER AND THAT DO NOT DISCOLOR SEALANTS OR ADJACENT SURFACES.
3. JOINT CONFIGURATION: CONCAVE JOINT CONFIGURATION PER FIGURE 5A IN ASTM C 1193, UNLESS OTHERWISE INDICATED.

- I. INSTALLATION OF PREFORMED SILICONE-SEALANT SYSTEM.
1. APPLY MASKING TAPE TO EACH SIDE OF JOINT, OUTSIDE OF AREA TO BE COVERED BY SEALANT SYSTEM.
2. COMPLETE INSTALLATION OF HORIZONTAL JOINTS BEFORE INSTALLING VERTICAL JOINTS. LAP VERTICAL JOINTS OVER HORIZONTAL JOINTS. AT END OF JOINTS, CUT SILICONE EXTRUSION WITH A RAZOR KNIFE.
- J. CLEAN EXCESS SEALANT OR SEALANT SMEARS ADJACENT TO JOINTS AS THE WORK PROGRESSES BY METHODS AND WITH CLEANING MATERIALS APPROVED IN WRITING BY MANUFACTURERS OF JOINT SEALANTS AND OF PRODUCTS IN WHICH JOINTS OCCUR.

3.2 JOINT-SEALANT SCHEDULE

- A. EXTERIOR JOINTS:
1. GENERAL USE:URETHANE, MULTI COMPONENT, NONSAG.
2. WOOD/WOOD, WOOD/BRICK: URETHANE, MULTI COMPONENT, NONSAG.
3. METAL/METAL, METAL/WOOD: URETHANE, MULTI COMPONENT, NONSAG.
4. BRICK/BRICK: URETHANE, MULTI COMPONENT, NONSAG.
5. UNDER METAL DOOR THRESHOLDS: BUTYL RUBBER, SNGL COMPONENT, NONSAG.
6. HORIZONTAL WEARING SURFACES: SEE DIVISION 2 SECTION "PAVEMENT JOINT SEALANTS"

7. GLAZING: SILICONE, SINGLE COMPONENT, NONSAG.
- B. INTERIOR JOINTS:
1. GENERAL USE:URETHANE, SINGLE COMPONENT, NONSAG.
2. PLUMBING FIXTURES, COUNTERTOPS, WET AREAS: SILICONE, SINGLE COMPONENT, NONSAG, MILDEW RESISTANT.
3. CERAMIC TILE: SILICONE, SINGLE COMPONENT, NONSAG, MILDEW RESISTANT.
4. HORIZONTAL WEARING SURFACES: URETHANE, SINGLE COMPONENT, POURABLE OR NONSAG.
5. UNDER DOOR THRESHOLDS: BUTYL RUBBER, SINGLE COMPONENT, NONSAG.

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. SECTION INCLUDES:
1. STANDARD HOLLOW METAL DOORS AND FRAMES.

1.2 SUBMITTALS

- A. PRODUCT DATA: FOR EACH TYPE OF PRODUCT INDICATED.
- B. SCHEDULE: PREPARED BY OR UNDER THE SUPERVISION OF SUPPLIER, USING SAME REFERENCE NUMBERS FOR DETAILS AND OPENINGS AS THOSE ON DRAWINGS.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
1. AMWELD BUILDING PRODUCTS, LLC.
2. CECO DOOR PRODUCTS; AN ASSA ABLOY GROUP COMPANY.
3. CURRIES COMPANY; AN ASSA ABLOY GROUP COMPANY.
4. STEELCRAFT; AN INGERSOLL-RAND COMPANY.

2.2 MATERIALS

- A. COLD-ROLLED STEEL SHEET: ASTM A 1008/A 1008M, CS, TYPE B; SUITABLE FOR EXPOSED APPLICATIONS.
- B. METALLIC-COATED STEEL SHEET: ASTM A 653/A 653M, COMMERCIAL STEEL (CS), TYPE B; WITH MINIMUM A40 (ZF120) METALLIC COATING.
- C. FRAME ANCHORS: ASTM A 591/A 591M, COMMERCIAL STEEL (CS), 40Z (12G) COATING DESIGNATION; MILL PHOSPHATIZED.
1. FOR ANCHORS BUILT INTO EXTERIOR WALLS, STEEL SHEET COMPLYING WITH ASTM A 1008/A 1008M OR ASTM A 1011/A 1011M, HOT-DIP GALVANIZED ACCORDING TO ASTM A 153/A 153M, CLASS B.
- D. INSERTS, BOLTS, AND FASTENERS: HOT-DIP GALVANIZED ACCORDING TO ASTM A 153/A 153M.
- E. GROUT: ASTM C 476, EXCEPT WITH A MAXIMUM SLUMP OF 4 INCHES (102 MM), AS MEASURED ACCORDING TO ASTM C 143/C 143M.
- F. MINERAL-FIBER INSULATION: ASTM C 665, TYPE I.
- G. GLAZING: DIVISION 08 SECTION "GLAZING."

2.3 STANDARD HOLLOW METAL DOORS

- A. GENERAL: COMPLY WITH ANSI/SDI A250.8.
1. DESIGN: FLUSH PANEL.
2. CORE CONSTRUCTION: MANUFACTURER'S STANDARD POLYSTYRENE OR POLYURETHANE.
- a. THERMAL-RATED (INSULATED) DOORS: R-VALUE OF NOT LESS THAN 19 WHEN TESTED ACCORDING TO ASTM C 1363.
3. VERTICAL EDGES FOR SINGLE-ACTING DOORS: SQUARE EDGE.
4. TOP AND BOTTOM EDGES: CLOSED WITH FLUSH OR INVERTED 0.042-INCH- (1.0-MM-) THICK, END CLOSURES OR CHANNELS OF SAME MATERIAL AS FACE SHEETS.
5. TOLERANCES: SDI 117, "MANUFACTURING TOLERANCES FOR STANDARD STEEL DOORS AND FRAMES."
- B. EXTERIOR DOORS: FACE SHEETS FABRICATED FROM METALLIC-COATED STEEL SHEET. COMPLY WITH ANSI/SDI A250.8 FOR LEVEL AND MODEL AND ANSI/SDI A250.4 FOR PHYSICAL PERFORMANCE LEVEL:
1. LEVEL 1 AND PHYSICAL PERFORMANCE LEVEL C (STANDARD DUTY).
- a. WIDTH: 1-3/4 INCHES (44.5 MM) OR AS INDICATED ON DRAWINGS.
2. LEVEL 3 AND PHYSICAL PERFORMANCE LEVEL A (EXTRA HEAVY DUTY), MODEL 1 (FULL FLUSH).
- C. HARDWARE REINFORCEMENT: ANSI/SDI A250.6.

2.4 STANDARD HOLLOW METAL FRAMES

- A. GENERAL: COMPLY WITH ANSI/SDI A250.8.
- B. EXTERIOR FRAMES: FABRICATED FROM METALLIC-COATED STEEL SHEET.
1. FABRICATE FRAMES WITH MITERED OR COPED CORNERS.
2. FABRICATE FRAMES AS KNOCKED DOWN UNLESS OTHERWISE INDICATED.
3. FABRICATE FRAMES WITH MITERED OR COPED CORNERS.
4. FRAMES FOR WOOD DOORS: 0.067-INCH- (1.7-MM-) THICK STEEL SHEET.
- C. HARDWARE REINFORCEMENT: ANSI/SDI A250.6.

2.5 FRAME ANCHORS

- A. JAMB ANCHORS:
1. MASONRY TYPE: ADJUSTABLE STRAP-AND-STIRRUP OR T-SHAPED ANCHORS TO SUIT FRAME SIZE, NOT LESS THAN 0.042 INCH (1.0 MM) THICK, WITH CORRUGATED OR PERFORATED STRAPS NOT LESS THAN 2 INCHES (50 MM) WIDE BY 10 INCHES (250 MM) LONG, OR WIRE ANCHORS NOT LESS THAN 0.177 INCH (4.5 MM) THICK.
2. STUD-WALL TYPE: DESIGNED TO ENGAGE STUD, WELDED TO BACK OF FRAMES; NOT LESS THAN 0.042 INCH (1.0 MM) THICK.
3. COMPRESSION TYPE FOR DRYWALL SLIP-ON FRAMES: ADJUSTABLE COMPRESSION ANCHORS.
- B. FLOOR ANCHORS: FORMED FROM SAME MATERIAL AS FRAMES, NOT LESS THAN 0.042 INCH (1.0 MM) THICK, AND AS FOLLOWS:
1. MONOLITHIC CONCRETE SLABS: CLIP-TYPE ANCHORS, WITH TWO HOLES TO RECEIVE FASTENERS.

2.6 FABRICATION

- A. TOLERANCES: FABRICATE HOLLOW METAL WORK TO TOLERANCES INDICATED IN SDI 117.
- B. HOLLOW METAL DOORS:
1. EXTERIOR DOORS: PROVIDE WEEP-HOLE OPENINGS IN BOTTOM OF EXTERIOR DOORS. SEAL JOINTS IN TOP EDGES OF DOORS AGAINST WATER PENETRATION.
- C. HOLLOW METAL FRAMES: WHERE FRAMES ARE FABRICATED IN SECTIONS, PROVIDE ALIGNMENT PLATES OR ANGLES AT EACH JOINT, FABRICATED OF SAME THICKNESS METAL AS FRAMES.
1. WELDED FRAMES: WELD FLUSH FACE JOINTS CONTINUOUSLY; GRIND, FILL, DRESS, AND MAKE SMOOTH, FLUSH, AND INVISIBLE.
2. PROVIDE COUNTERSUNK, FLAT- OR OVAL-HEAD EXPOSED SCREWS AND BOLTS FOR EXPOSED FASTENERS UNLESS OTHERWISE INDICATED.
3. GROUT GUARDS: WELD GUARDS TO FRAME AT BACK OF HARDWARE MORTISES IN FRAMES TO BE GROUTED.
4. FLOOR ANCHORS: WELD ANCHORS TO BOTTOM OF JAMBS AND MULLIONS WITH AT LEAST FOUR SPOT WELDS PER ANCHOR.
5. JAMB ANCHORS: PROVIDE NUMBER AND SPACING OF ANCHORS AS FOLLOWS:
- a. MASONRY TYPE: LOCATE ANCHORS NOT MORE THAN 18 INCHES (457 MM) FROM TOP AND BOTTOM OF FRAME. SPACE ANCHORS NOT MORE THAN 32 INCHES (813

- MM) O.C. AND AS FOLLOWS:
- 1) THREE ANCHORS PER JAMB FROM 60 TO 90 INCHES (1524 TO 2286 MM) HIGH.
- b. STUD-WALL TYPE: LOCATE ANCHORS NOT MORE THAN 18 INCHES (457 MM) FROM TOP AND BOTTOM OF FRAME. SPACE ANCHORS NOT MORE THAN 32
- INCHES (813 MM) O.C. AND AS FOLLOWS:
- 1) FOUR ANCHORS PER JAMB FROM 60 TO 90 INCHES (1524 TO 2286 MM) HIGH.
- c. COMPRESSION TYPE: NOT LESS THAN TWO ANCHORS IN EACH JAMB.
- d. POSTINSTALLED EXPANSION TYPE: LOCATE ANCHORS NOT MORE THAN 6 INCHES (152 MM) FROM TOP AND BOTTOM OF FRAME. SPACE ANCHORS NOT MORE THAN 26 INCHES (660 MM) O.C.
6. DOOR SILENCERS: EXCEPT ON WEATHER-STRIPPED DOORS, DRILL STOPS TO RECEIVE DOOR SILENCERS.
- a. SINGLE-DOOR FRAMES: THREE DOOR SILENCERS.
- D. HARDWARE PREPARATION: FACTORY PREPARE HOLLOW METAL WORK TO RECEIVE TEMPLATED MORTISED HARDWARE ACCORDING TO THE DOOR HARDWARE SCHEDULE AND TEMPLATES FURNISHED AS SPECIFIED IN DIVISION 08 SECTION "DOOR HARDWARE."
1. LOCATE HARDWARE AS INDICATED, OR IF NOT INDICATED, ACCORDING TO ANSI/SDI A250.8.
2. REINFORCE DOORS AND FRAMES TO RECEIVE NONTEMPLATED, MORTISED AND SURFACE-MOUNTED DOOR HARDWARE.
3. COMPLY WITH APPLICABLE REQUIREMENTS IN ANSI/SDI A250.6 AND ANSI/DHI A115 SERIES SPECIFICATIONS FOR PREPARATION OF HOLLOW METAL WORK FOR HARDWARE.
4. COORDINATE LOCATIONS OF CONDUIT AND WIRING BOXES FOR ELECTRICAL CONNECTIONS WITH DIVISION 26 ELECTRICAL SECTIONS.

2.7 STEEL FINISHES

- A. PRIME FINISH: APPLY MANUFACTURER'S STANDARD PRIMER IMMEDIATELY AFTER CLEANING AND PRETREATING:
1. SHOP PRIMER: ANSI/SDI A250.10.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. HOLLOW METAL FRAMES: COMPLY WITH ANSI/SDI A250.11.
1. SET FRAMES ACCURATELY IN POSITION, PLUMBED, ALIGNED, AND BRACED SECURELY UNTIL PERMANENT ANCHORS ARE SET. AFTER WALL CONSTRUCTION IS COMPLETE, REMOVE TEMPORARY BRACES, LEAVING SURFACES SMOOTH AND UNDAMAGED.
- a. INSTALL DOOR SILENCERS IN FRAMES BEFORE GROUTING.
- b. REMOVE TEMPORARY BRACES NECESSARY FOR INSTALLATION ONLY AFTER FRAMES HAVE BEEN PROPERLY SET AND SECURED.
- c. CHECK PLUMBNESS, SQUARENESS, AND TWIST OF FRAMES AS WALLS ARE CONSTRUCTED. SHIM AS NECESSARY TO COMPLY WITH INSTALLATION TOLERANCES.
2. FLOOR ANCHORS: PROVIDE FLOOR ANCHORS FOR EACH JAMB AND MULLION THAT EXTENDS TO FLOOR, AND SECURE WITH POSTINSTALLED EXPANSION ANCHORS.
- a. FLOOR ANCHORS MAY BE SET WITH POWDER-ACTUATED FASTENERS INSTEAD OF POSTINSTALLED EXPANSION ANCHORS IF SO INDICATED AND APPROVED ON SHOP DRAWINGS.
3. METAL-STUD PARTITIONS: SOLIDLY PACK MINERAL-FIBER INSULATION BEHIND FRAMES.
4. MASONRY WALLS: COORDINATE INSTALLATION OF FRAMES TO ALLOW FOR SOLIDLY FILLING SPACE BETWEEN FRAMES AND MASONRY WITH GROUT.
5. IN-PLACE CONCRETE OR MASONRY CONSTRUCTION: SECURE FRAMES IN PLACE WITH POSTINSTALLED EXPANSION ANCHORS. COUNTERSINK ANCHORS, AND FILL AND MAKE SMOOTH, FLUSH, AND INVISIBLE ON EXPOSED FACES.
6. IN-PLACE GYPSUM BOARD PARTITIONS: SECURE FRAMES IN PLACE WITH POSTINSTALLED EXPANSION ANCHORS THROUGH FLOOR ANCHORS AT EACH JAMB. COUNTERSINK ANCHORS, AND FILL AND MAKE SMOOTH, FLUSH, AND INVISIBLE ON EXPOSED FACES.
7. INSTALLATION TOLERANCES: ADJUST HOLLOW METAL DOOR FRAMES FOR SQUARENESS, ALIGNMENT, TWIST, AND PLUMB TO THE FOLLOWING TOLERANCES:
- a. SQUARENESS: PLUS OR MINUS 1/16 INCH (1.6 MM), MEASURED AT DOOR RABBIT ON A LINE 90 DEGREES FROM JAMB PERPENDICULAR TO FRAME HEAD.
- b. ALIGNMENT: PLUS OR MINUS 1/16 INCH (1.6 MM), MEASURED AT JAMBS ON A HORIZONTAL LINE PARALLEL TO PLANE OF WALL.
- c. TWIST: PLUS OR MINUS 1/16 INCH (1.6 MM), MEASURED AT OPPOSITE FACE CORNERS OF JAMBS ON PARALLEL LINES, AND PERPENDICULAR TO PLANE OF WALL.
- d. PLUMBNESS: PLUS OR MINUS 1/16 INCH (1.6 MM), MEASURED AT JAMBS AT FLOOR.
- B. HOLLOW METAL DOORS: FIT HOLLOW METAL DOORS ACCURATELY IN FRAMES, WITHIN CLEARANCES SPECIFIED BELOW. SHIM AS NECESSARY.
1. NON-FIRE-RATED STANDARD STEEL DOORS:
- a. JAMBS AND HEAD: 1/8 INCH (3 MM) PLUS OR MINUS 1/16 INCH (1.6 MM).
- b. BETWEEN EDGES OF PAIRS OF DOORS: 1/8 INCH (3 MM) PLUS OR MINUS 1/16 INCH (1.6 MM).
- c. BETWEEN BOTTOM OF DOOR AND TOP OF THRESHOLD: MAXIMUM 3/8 INCH (9.5 MM).
- d. BETWEEN BOTTOM OF DOOR AND TOP OF FINISH FLOOR (NO THRESHOLD): MAXIMUM 3/4 INCH (19 MM).

3.2 ADJUSTING AND CLEANING

- A. FINAL ADJUSTMENTS: CHECK AND READJUST OPERATING HARDWARE ITEMS IMMEDIATELY BEFORE FINAL INSPECTION. LEAVE WORK IN COMPLETE AND PROPER OPERATING CONDITION. REMOVE AND REPLACE DEFECTIVE WORK, INCLUDING HOLLOW METAL WORK THAT IS WARPED, BOWED, OR OTHERWISE UNACCEPTABLE.
- B. PRIME-COAT TOUCHUP: IMMEDIATELY AFTER ERECTION, SAND SMOOTH RUSTED OR DAMAGED AREAS OF PRIME COAT AND APPLY TOUCHUP OF COMPATIBLE AIR-DRYING, RUST-INHIBITIVE PRIMER.
- METALLIC-COATED SURFACES: CLEAN ABRADED AREAS AND REPAIR WITH GALVANIZING REP.

SECTION 0814